



Comprehensive Optimization Method for Planning and Operation of Energy Storage System (ESS)

A novel planning and operation of ESS technology for integrating massive renewable energy access to power grid

Méthode Compréhensive d'Optimisation pour la Planification et l'Opération du Système de Stockage d'Énergie (SSE)

Une nouvelle technologie SSE pour la planification et l'opération

Introduction

Due to its high instability and intermittence, the renewable energy, if applied on a large scale to power grid, will cause a series of problems and bring challenges and potential threats to the security and stability of power system.

This invention has made a breakthrough in the field of large-scale Energy Storage System (ESS) application based on advanced optimization methods and control techniques. It presents a comprehensive ESS planning and operation solution.

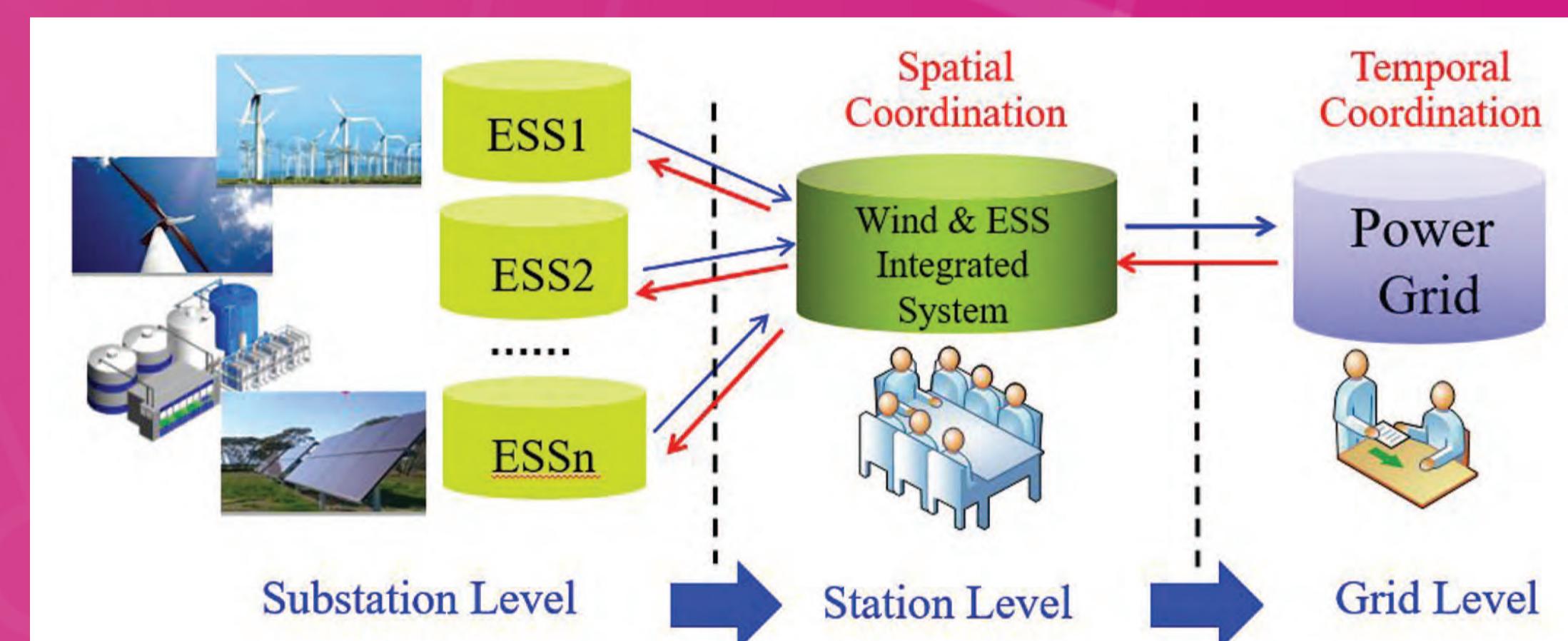
The system has been applied in the world's maximum rated power Vanadium Redox Flow battery station, and increased the effective consumption of massive renewable energy in power systems.



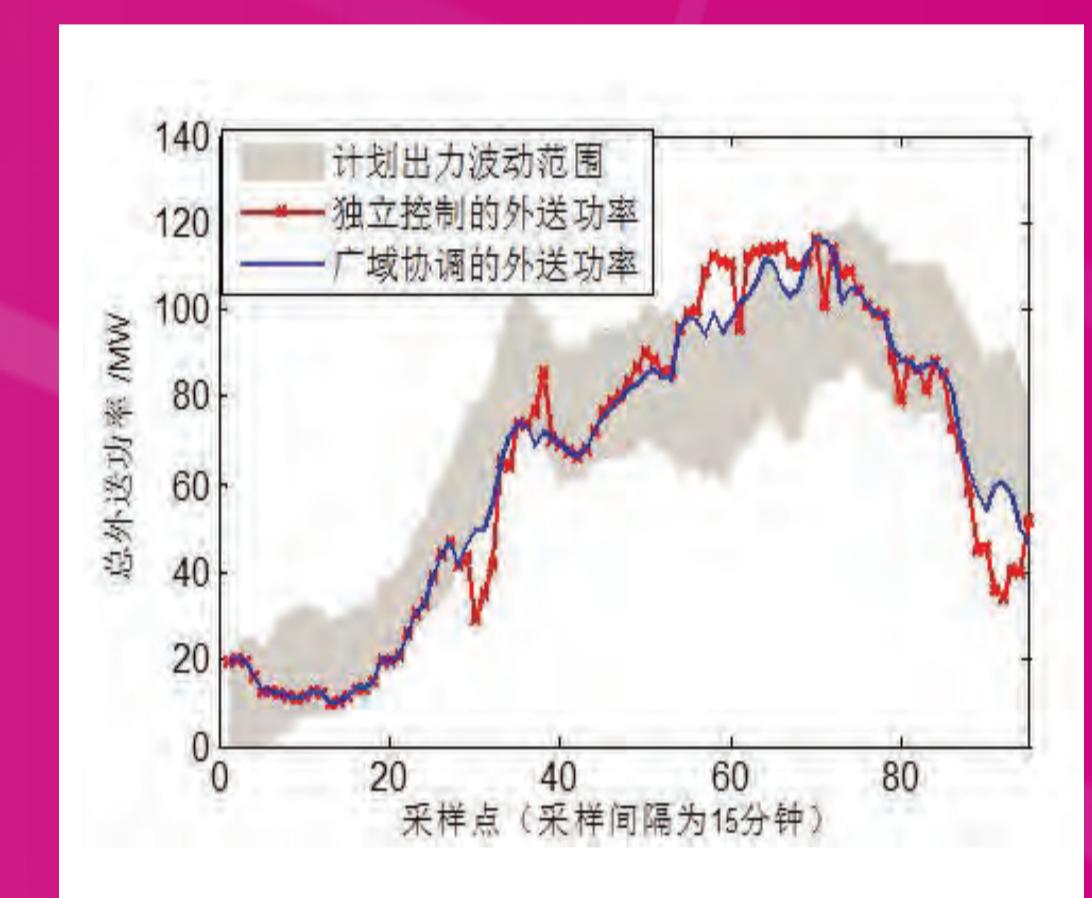
Fuel Tank of ESS



Control System of ESS



Coordinated Control Schema



The Output Power of Wind ESS Integrated System

Special Features and Advantages

- Applied in the world's maximum rated power Vanadium Redox Flow Battery station (5MW/10MWh)
- High effectiveness (increasing wind power consumption by 828MWh per year)
- High flexibility (able to support multiple and various ESS stations)

Applications

- The technique has been implemented and applied to the design and construction of Woniushi ESS Station since May 2013 in Liaoning Province, China

Caractéristiques Particulières et Avantages

- Appliquée dans la station à accumulateurs de type vanadium redox numéro un au monde (5MW/10MWh)
- Haute efficacité (augmente la consommation de l'énergie éolienne de 828MWh par an)
- Haute flexibilité (peut supporter de multiples stations différentes)

Applications

- Cette technique a été mise en œuvre et appliquée dans la conception et la construction de la station SSE de Woniushi ESS Station depuis mai 2013 dans la Provence de Liaoning en Chine

Awards

Second Prize, Science and Technology Progress Award, Liaoning, China (2015)

Intellectual Property

PRC Patent: ZL201310452591.1, ZL201310295998.8,
ZL 201310294095.8

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